299-E28-73 (A6824)

Log Data Report

Borehole Information:

Borehole:	299-E28-73 (A6824)		Site:	241-B-361 Settling Tank	
Coordinates (WA State Plane)		GWL (ft)[1]:	Not reached	GWL Date:	N/A[2]
North	East	Drill Date	TOC[3] Elevation	Total Depth (ft)	Type
136,712.3 m	573,770.1 m	May 1979	689 ft	40	Cable Tool

Casing Information:

Casing Type	Stickup (ft)	Outer Diameter (in.)	Inside Diameter (in.)	Thickness (in.)	Top (ft)	Bottom (ft)
Steel Welded	0	6.625	6.0	0.3125	0	40

Borehole Notes:

The logging engineer measured the casing using a steel tape. One reference point survey "X" is located on top of the casing. Zero reference is the top of casing stickup. Top of casing stickup is cut squarely. HWIS[4] is the source of the TOC elevation and coordinates. Total depth and casing bottom are reported from information provided in Chamness and Merz (1993). The ground surface surrounding the borehole is covered with crushed concrete 6- to 8-in. thick. On 05/31/02, the borehole was swabbed, and no contamination was detected.

Logging Equipment Information:

Logging System:	Gamma 1D		Type:	SGLS (35%)
Calibration Date:	7/01/01	Calibration Reference:	GJO-2002-243-TAR	
		Logging Procedure:	MAC-HGLP 1.6.5, Rev. 0	

Spectral Gamma Logging System (SGLS) Log Run Information:

Log Run	1	Repeat Section			
Date	05/31/02	05/31/02			
Logging Engineer	Spatz	Spatz			
Start Depth (ft)	39.0	29.0			
Finish Depth (ft)	0	34.0			
Count Time (sec)	100	100			
Live/Real	R	R			
Shield (Y/N)	N/A	N/A			
MSA Interval (ft)	0.5	0.5			
ft/min	N/A	N/A			
Pre-Verification	AD004CAB	AD004CAB			
Start File	AD004000	AD004079			
Finish File	AD004078	AD004089			
Post-Verification	AD005CAA	AD005CAA			
Depth Return	0	0			

Log Run	1	Repeat Section			
Error (in.)					
Comments	No fine-gain adjustment.	No fine-gain adjustment.			

Logging Operation Notes:

Zero reference is the top of casing for the SGLS logging. Logging was performed with a centralizer installed on the sonde. Pre- and post-survey verification measurements for the SGLS employed the Amersham KUT verifier with SN 118.

Analysis Notes:

Analyst:	Sobczyk	Date:	06/17/02	Reference:	MAC-HGLP 1.6.3, Rev. 0

SGLS pre-run and post-run verification spectra were collected at the beginning and end of the day. The verification spectra were all within the control limits. The peak counts per second (cps) at the 609-keV, 1461-keV, and 2615-keV photopeaks on the post-run verification spectrum as compared to the pre-run verification spectrum were about 8 percent lower.

Log spectra for the SGLS were processed in batch mode using APTEC Supervisor to identify individual energy peaks and determine count rates. The post-run verification spectrum was used to determine the energy and resolution calibration for processing the data using APTEC Supervisor. Concentrations were calculated in EXCEL (source file: G1DJul1.xls), using parameters determined from analysis of recent calibration data. Zero reference is the top of the casing. The casing configuration was assumed to be one string of 6-in. casing with a thickness of 0.3125 in. to a log depth of 40 ft. This casing thickness was measured by the logging engineer. A water correction was not needed or applied to the SGLS data. Dead time corrections were not needed because dead time did not exceed 10.5 percent.

Log Plot Notes:

Separate log plots are provided for gross gamma and dead time, naturally occurring radionuclides (^{40}K, ^{238}U, and ^{232}Th), and man-made radionuclides. For each radionuclide, the energy value of the spectral peak used for quantification is indicated. Unless otherwise noted, all radionuclides are plotted in picocuries per gram (pCi/g). The open circles indicate the minimum detectable level (MDL) for each radionuclide. Error bars on each plot represent error associated with counting statistics only and do not include errors associated with the inverse efficiency function, dead time correction, or casing correction. These errors are discussed in the calibration report. A combination plot is also included to facilitate correlation.

Results and Interpretations:

Man-made radionuclides were not detected during logging in this borehole.

Recognizable changes in the KUT logs occurred in this borehole. Increases in apparent ^{40}K activity of about 5 pCi/g occur at approximately 20 and 32 ft. The apparent ^{40}K activities above 20 ft are anomalously low probably due to the installation of a surface seal of grout around the casing (Chamness and Merz 1993). The increase in ^{40}K activities at 32 ft probably represents the finer grained sediments of the Hanford H2.

The plots of the repeat logs demonstrate good repeatability of the SGLS data for the naturally occurring radionuclides.

References:

Chamness, M.A., and J.K. Merz, 1993. *Hanford Wells*, PNNL-8800, UC-903, Pacific Northwest Laboratory, Richland, Washington.

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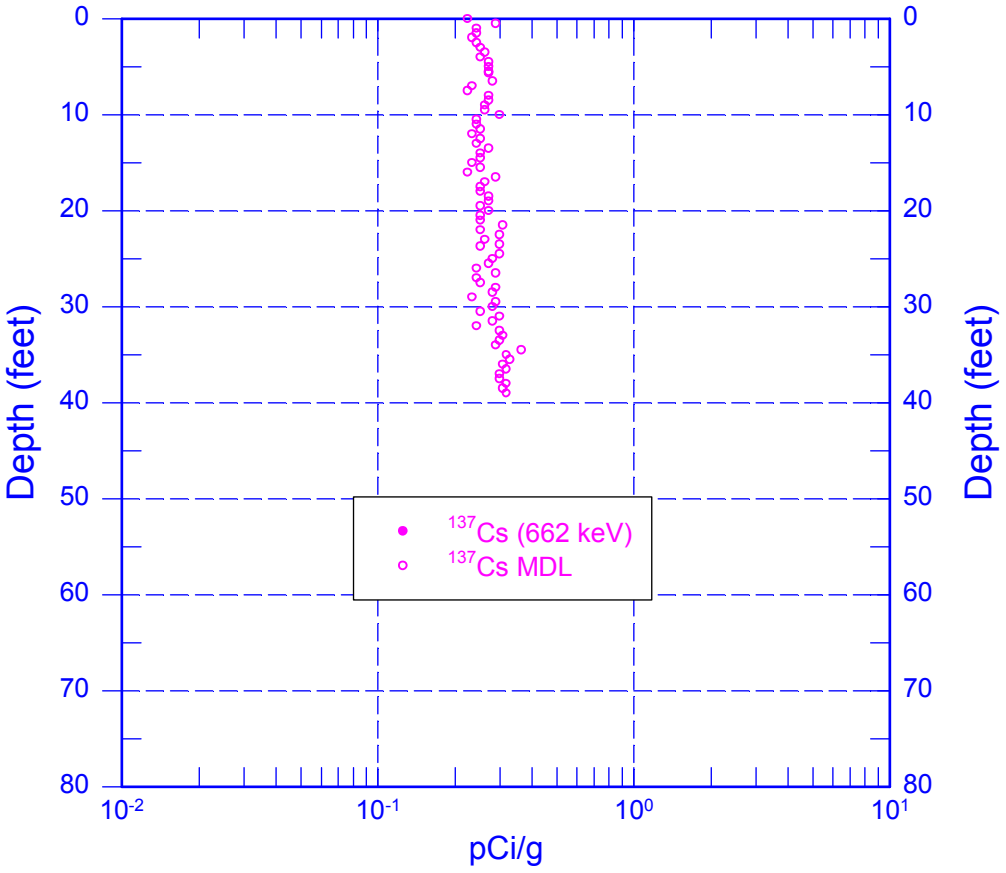
[1] GWL – groundwater level
[2] TOC – top of casing
[3] N/A – not applicable
[4] HWIS – Hanford Well Information System

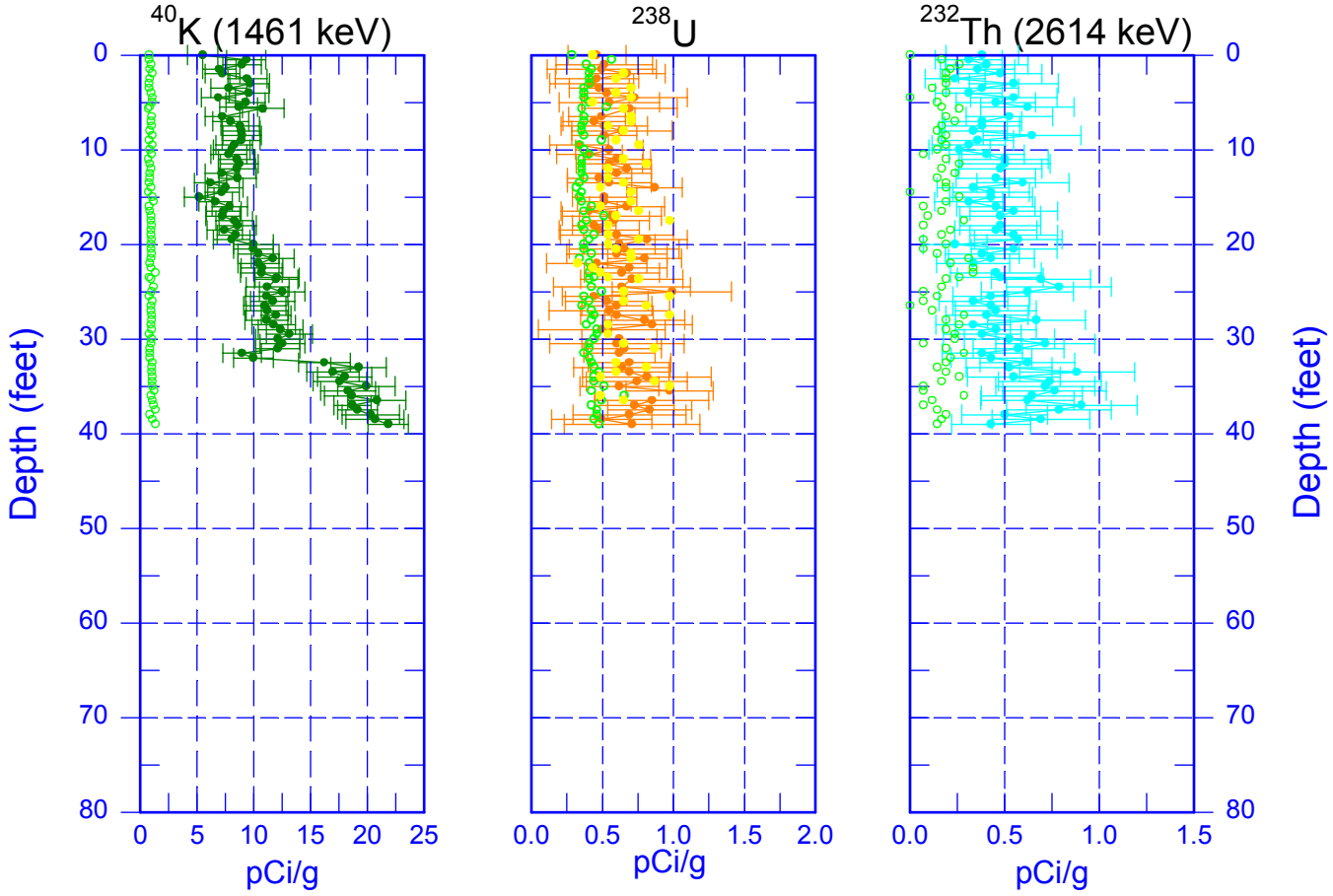
299-E28-73 (A6824)
Man-Made Radionuclides



Zero Reference = Top of Casing

Date of Last Logging Run
05/31/2002

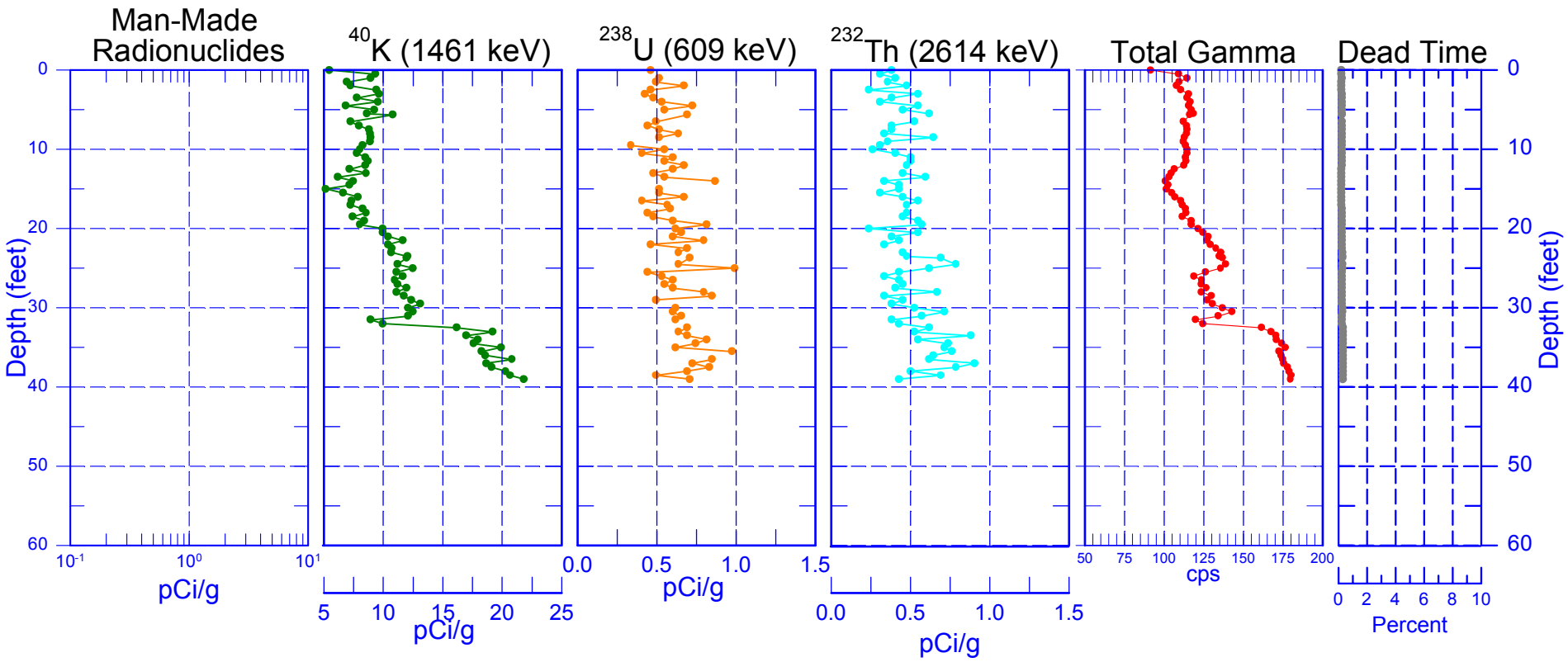
299-E28-73 (A6824)
Natural Gamma Logs



Zero Reference = Top of Casing

Date of Last Logging Run
05/31/2002

299-E28-73 (A6824) Combination Plot



Zero Reference = Top of Casing

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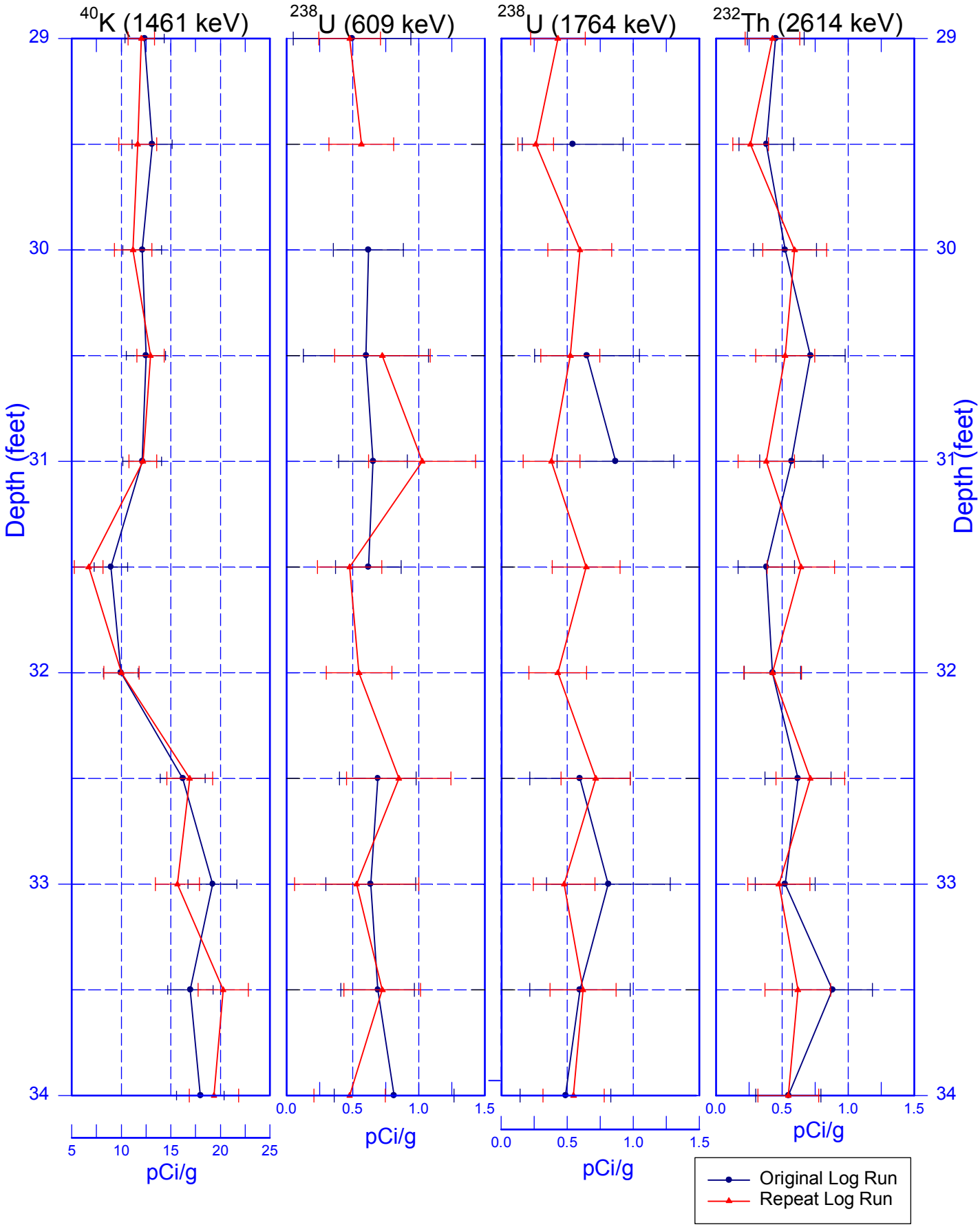
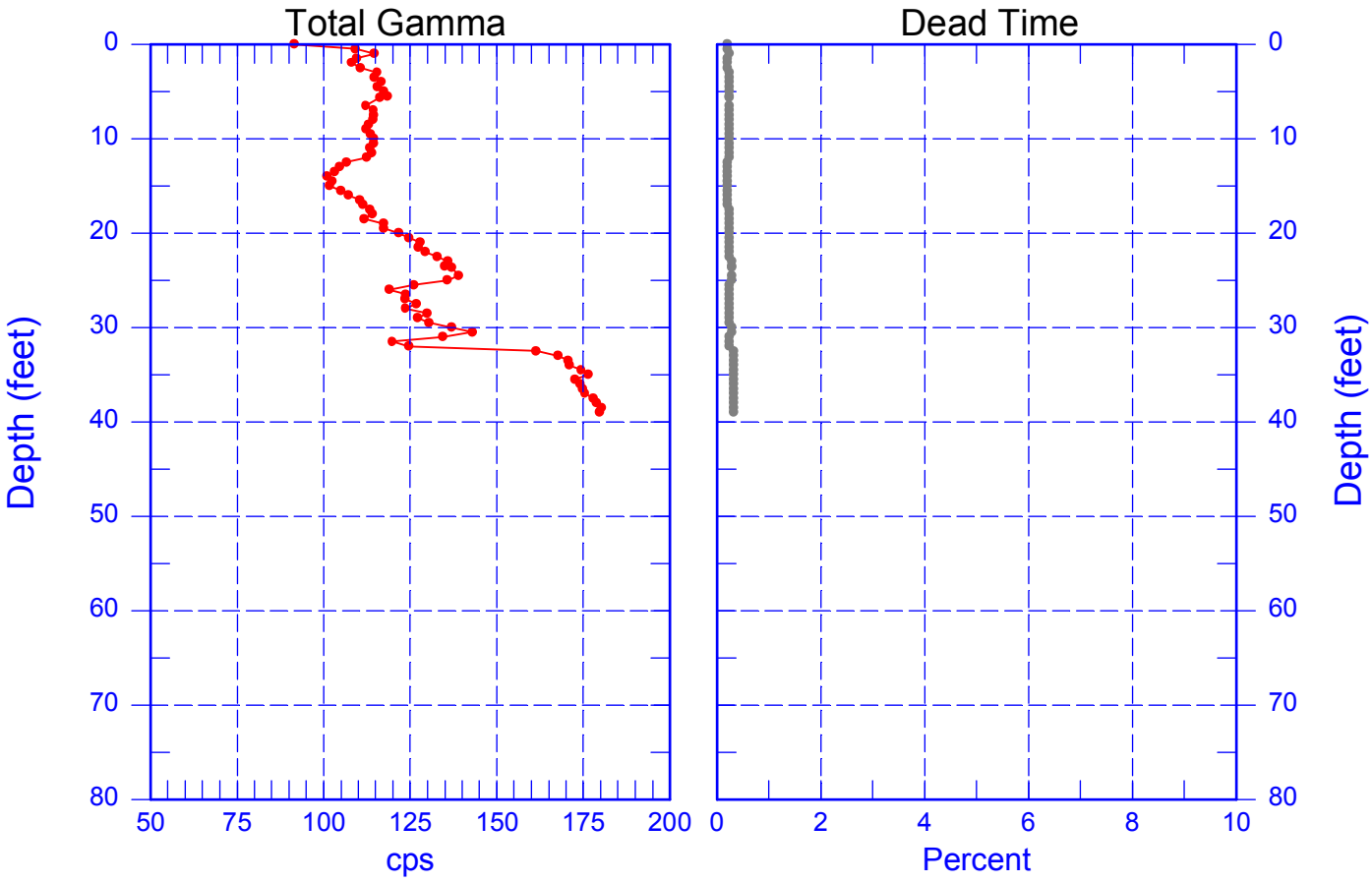
299-E28-73 (A6824)

Rerun of Natural Gamma Logs (29.0 to 34.0 ft)



299-E28-73 (A6824)
Total Gamma & Dead Time



Zero Reference = Top of Casing

Date of Last Logging Run
05/31/2002